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EXAMINER

PARKER, KENNETH

ART UNIT

PAPER NUMBER

2871

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Please find below and/or attached an Office communication concerning this application or proceeding.



***Claim Rejections - 35 USC § 103***

**Claims 1, 3-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Clerc 4701028 in view of Clerc "Vertically aligned Liquid-Crystal Displays" and Kashnow 3914022 and Hirose et al 5229873.**

The Clerc reference shows in figure 4 claim 1 including a liquid crystal cell comprising a pair of substrates 19-20 and a liquid crystal layer 18 arranged between the pair of substrates; first and second polarizers 21-22 arranged on either side of the liquid crystal cell; a first retardation plate 24 arranged between the liquid crystal cell and the first polarizer and a second retardation plate arranged between the liquid crystal cell and the second polarizer 23; each of the first and second retardation plates having an optical axis in a plane parallel to the surfaces of the substrates and a retardation of substantially  $\frac{1}{4}$  (see column 6, lines 44-55 which indicate a retardation of 150nm, which is in the range applicant lists as corresponding to substantially  $\frac{1}{4}$  wave and is exactly a quarter wave for 600 nm which is in the visible spectrum), the optical axis of the first retardation plate being perpendicular to the optical axis of the second retardation plate (see cover figure), the first and second polarizers having polarizing axes arranged at an angle of 45 with respect to the optical axes of the first and second retardation plates (also see figure), however lacking from the disclosure is the and the liquid crystal cell having a plurality of pixels arranged such that each pixel includes at least first and second regions in which an alignment of the liquid crystal in the first region is different from an alignment of the liquid crystal in the second region. The secondary reference

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indicates that a device of the same type as the primary reference can be aligned stably without rubbing by using the slit, which inherently produces two domains. As rubbing was known to be a problem, the avoidance of rubbing would have been recognized as a considerable benefit. The secondary reference is evidence that ordinary workers in the art would find a reason, suggestion or motivation to a slit, thereby producing two domains.

Still lacking was the polarizers being crossed. Crossed vs parallel was a well known functionally equivalent alternative whether one wanted normally white or normally black operation. This is evidenced by the discussion in Kashnow (column 3, lines 55-65). That it would work is evidenced by Hirose which shows a crossed configuration with the slit type device, also showing the desirability of such configuration. Therefore one of ordinary skill would have found reason, motivation and suggestion to modify Clerc et al as modified above because the two configurations were known functionally equivalent alternatives and as Hirose evidenced the desirability of the crossed configuration.

The Clerc reference shows Claim 2 including a liquid crystal cell comprising a pair of substrates and a liquid crystal layer arranged between the pair of substrates; first and second polarizers arranged on either side of the liquid crystal cell; a first retardation plate arranged between the liquid crystal cell and the first polarizer; a second retardation plate arranged between the liquid crystal cell and the second polarizer; each of the first and second retardation plates having an optical axis in a plane parallel to the surfaces of the substrates and a retardation of substantially

$\lambda/4$ , the optical axis of the first retardation plate being perpendicular to the optical axis of the second retardation plate; the first and second polarizers having polarizing axes arranged at an angle of 45 with respect to the optical axes of the first and second retardation plates (these features are identified in the action above).

Claim 3, a liquid crystal display device according to claim 1 or 2, wherein at least a portion of the liquid crystal molecules are aligned in the azimuth except for 45 from the polarizing axes of the polarizers. Claim 4, a liquid crystal display device according to claim 1 or 2, wherein the liquid crystal of the liquid crystal cell is of a vertical alignment type, the liquid crystal cell includes a structure or a slit arranged on the electrode of at least one of the substrates, and a state of alignment of the liquid crystal molecules located on one side of the structure or the slit is different from a state of alignment of the liquid crystal molecules located on the other side of the structure or slit.

Claim 5 including the device according to claim 4, wherein liquid crystal molecules located on the structure or slit are aligned, accompanying a change in the azimuth upon application of voltage. Again, this is a functional description which should be inherently met by the reference.

Therefore also shown is claim 7 including a liquid crystal cell comprising the same as claim 1, wherein the liquid crystal cell including structures or slits arranged on or in an electrode of at least one of the substrates, a state of alignment of the liquid crystal molecules located on one side of the structure or the slit being different from a state of alignment of the liquid crystal molecules located on the other side of the

structure or the slit; and a retardation in the plane of the retardation plate being not less than 120 nm and not more than 160 nm (met in accordance with the discussion above).

Therefore also shown is claim 8 including the device according to claim 7, wherein an angle between the absorbing axis of the polarizer and the aligning direction or the inclining direction of liquid crystal molecules is not less than 50, and the contrast characteristic is symmetrical with respect to the horizontal direction (these functional characteristics should be met, as the structure is the same as applicants).

**Claim 6 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Clerc 4701028 in view of Clerc “Vertically aligned Liquid-Crystal Displays” and Kashnow 3914033 and Hirose et al 5229873 as applied above, and further in view of Koma JP 07-311383 .**

Claim 6 adds to a claim substantially that the at least one of the pair of substrates having electrically conductive linear structures which protrude with respect to a substantially flat surface of the electrode. The reference as modified above has a window, not linear conductive structures. Koma discloses a device with linear conductive structures that are above the plane of the electrodes (see the protrusion in the electrode of the cover figure). The linear structure is made by putting down a material under the electrode and thereby creating a portion that is higher than the rest of the electrode, and therefore is a linear strip that protrudes with respect to the substantially flat electrode surface. Koma indicates that their structure “provides a liquid crystal display device of a wide visual field angle by dividing display pixel and

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specifying orientation vectors of the liquid crystal directors.” In fact Koma specifically shows the structure as an alternative to the slit structures of the Clerc publication. Therefore one of ordinary skill would have found the reason, suggestion or motivation for modifying the structure of Clerc as modified above for the above mentioned motivation

Such compensators were well known for improving viewing angle by compensating for the change in birefringence at off axis directions. Both references disclose such compensators, evidencing the well known status. Therefore it would have been obvious to one of ordinary skill, in the device of Clerc, to employ a negative birefringent film (or films) to compensate for the change in birefringence in off axis directions.

**Claim 9 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Clerc 4701028 in view of Clerc “Vertically aligned Liquid-Crystal Displays” and Kashnow 3914033 and Hirose et al 5229873 as applied above , and further in view of Harris et al 5344916 and Arakawa et al 5189538.**

Lacking from the disclosure is the negative birefringent compensator. Such compensators were well known for improving viewing angle by compensating for the change in birefringence at off axis directions. Both references disclose such compensators, evidencing the well known status. Therefore it would have been obvious



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to one of ordinary skill, in the device of Clerc, to employ a negative birefringent film (or films) to compensate for the change in birefringence in off axis directions.

### ***Allowable Subject Matter***

Claims 14-16 are allowed

The reason for the indication of allowable subject matter re claims 14-16 is the five plates as claimed as claimed to the retarders and particularly with the pair that each has zero negative birefringence.

### ***Response to Arguments***

Applicant's arguments with respect to claims have been considered not found persuasive. Applicant argues that showing an example which is different (the polarizer angles ) is an express teaching away, however an example that shows crossed polarizers vs parallel doesn't teach away unless it expressly discusses the undesirability of one configuration. The two configurations parallel vs crossed were well known functionally equivalent alternative whether one wanted normally white or normally black, and evidence of this has been added to the rejections above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP



§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

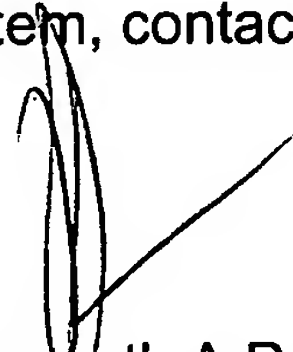
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth A. Parker whose telephone number is 571-272-2298. The examiner can normally be reached on M-F 10:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Kenneth A Parker  
Primary Examiner  
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